

GANPAT UNIVERSITY									
U.V. PATEL COLLEGE OF ENGINEERING									
DEPARTMENT OF MARINE ENGINEERING & MARITIME STUDIES									
Programme			Electro Technical Officers			Branch/Spec.		Marine Engineering	
Semester			-			Version		1.0.0.0	
Effective from Academic Year			2019-2020			Effective for the batch Admitted in		Dec-2019	
Subject code			ETO103			Subject Name		Electric Machines	
Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	-	-	-	-	-	Theory	40	60	100
Hours	4	0	0	0	4	Practical	-	-	-
Pre-requisites:									
Learning Outcome:									
After successful completion of the course, student will be able to									
• Comply with the DGS prescribed ETO Guidelines Competency number 1.2, & 3									
Theory syllabus									
Unit	Content								Hrs
	Ref. DGS prescribed ETO Guidelines - Comp. No.1.2 - Monitor the operation of Electrical, electronic & control systems								
1	Competency No.1.2.1 - Basic knowledge of heat transmission: 1. Starter panels including DOL, star-delta, auto-transformer & soft starter 2. Testing motors, insulation resistance, phase balance & other criteria								20
2	Competency No.1.2.2 - Electrical power distribution board and electrical equipments: 1. Conductors, insulation materials, Insulation Class, Hot spot temperatures, IP rating, Ex rating, drip proof construction 2. Different types of cables & how to read format 3. Creepage, Insulation breakdown & some SF6 components for high voltage systems, hot-spot' temperatures, insulation class & continuous rating of machinery.								4
3	Competency No.1.2.3 - Instrumentation alarm and monitoring systems: 1. Construction of distributed monitoring systems for engine room 2. Explain purpose structure and functions of fire detection systems								4
4	Competency No.1.2.4 - Electrical drives: 1. Direct On-line starter 2.Star Delta Starter 3. Auto Transformer Starter 4. Starter with Drives								2
5	Competency No.1.2.5 - Technology of electrical materials: - Knowledge about electrical materials								2
6	Competency No.1.2.6 - Electro hydraulic and pneumatic control systems: 1. Fluid systems, Nomenclature, function of primary components, pump displacement, Hi –Lo system for crane 2. Directional control valves 3. Proportional control valve (mechanical & electronic) 4. Working circuits for pneumatics & hydraulics								6
7	Competency No.1.2.7 - Appreciation of hazards of voltage: 1. Explain the possibility of the electrical shocks 2. Explains the difference of electric shock caused by low and high voltage								2

GANPAT UNIVERSITY									
U.V. PATEL COLLEGE OF ENGINEERING									
DEPARTMENT OF MARINE ENGINEERING & MARITIME STUDIES									
Programme			Electro Technical Officers			Branch/Spec.		Marine Engineering	
Semester			-			Version		1.0.0.0	
Effective from Academic Year			2019-2020			Effective for the batch Admitted in		Dec-2019	
Subject code			ETO103			Subject Name		Electric Machines	
Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	-	-	-	-	-	Theory	40	60	100
Hours	4	0	0	0	4	Practical	-	-	-
Pre-requisites:									
Learning Outcome:									
After successful completion of the course, student will be able to									
• Comply with the DGS prescribed ETO Guidelines Competency number 1.2, & 3									
Theory syllabus									
Unit	Content								Hrs
	Ref. DGS prescribed ETO Guidelines - Comp. No.3 - Operate Generators and Distribution Systems								
8	Competency No.3.1 - Starting a Generator: 1. The operational concerns of starting & running a generator 2. Engine Management system of the Alternator engine; starting valve, timing for starting valve, forced shut off periods & all other shutdowns 3. Space heaters ,Temperature monitoring, Passive components of the Alternator (Reactor, compensation element etc)								2
9	Competency No.3.2 - Paralleling, load sharing & changing over generators: 1. Alternator circuit schematic with excitation systems 2. AVR function & concerns 3. Reactive Loading & the role of AVR & Governors 4. Phase sequencing & paralleling generators								2
10	Competency No.3.3 - Generator protection Systems: 1. Special purpose relays such as Voltage relays, phase sequence relays, power transducers, their connections & power management systems 2. Transducers for sensing KW, KVA, KVAR & cosφ								3
11	Competency No.3.4 - Switch board protection systems: Relevance of ‘Reverse power’ & the protection techniques								3
Total Hours								50	
Practical content									
Text Books									
1									
Reference Books									
1	“Principle of Electrical Machines” by Mehta V K and Mehta Rohit								
2	“Electrical Machinery” by P S Bimbhra								
3	“Electrical Machines” by S K Bhattacharya								